November 9, 2004 – mini-Quiz #8 – 8.03

Your name . . . . . .

Mark your recitation: R01 – R02 – R03 – R04 – R05

What are the boundary conditions for an oscillating Electric field (with angular frequency ω) at the surface of an ideal conductor in vacuum?

(5 points)

$$E_n = \rho_s/\epsilon_o$$

Give the meaning and the SI units of all symbols, including E_n

E_n is the component of the E-field normal to the surface; its units are V/m, ρ_s is the surface charge density (C/m^2), and ϵ_o is the permittivity of free space; its units are $C/(Vm)$ which is also F/m.

(5 points)

$$E_t = 0$$

Give the meaning and the SI units of all symbols, including E_t.

E_t is the component of the E-field in the plane of the surface (it's also called the tangential component); its units are V/m.